

REMARKS

Claims 1-15 are pending in the application.

The Office action objects to FIGs. 1 and 2 for not including a "Prior Art" designation. Enclosed is a proposed change to FIGs. 1 and 2, adding the "Prior Art" designation, for the Examiner's review. If approved, formal drawings incorporating this change will be submitted upon receipt of a Notice of Allowability.

The Office action objects to the drawings for not including the claimed subject matter of claim 15. Enclosed is a proposed additional drawing, FIG. 8, for the Examiner's review. If approved, a corresponding formal drawing will be submitted upon receipt of a Notice of Allowability. The specification is amended herein to include reference to this drawing. As evidenced by the single added phrase in the specification, "as illustrated in FIG. 8", the applicant respectfully maintains that this drawing adds no new matter, because the drawing needs no further explanation in the specification as originally filed. The applicant specifically teaches two substrates having lines of weakness separated by a liquid crystal layer (applicant's page 5, lines 1-5; page 12, line 28 through page 13, line 5), and this drawing is merely a double replication of the drawing of a substrate 20 having lines of weakness in FIG. 4, with the separation between the double replications, 20 and 22, being identified as the liquid crystal layer 24.

The Office action rejects claims 1-3, 5, 10, and 12-14 under 35 U.S.C. 102(b), over Yamazaki et al. (USP 5,821,138, hereinafter Yamazaki). The applicant respectfully traverses this rejection.

Independent claim 1 recites a matrix device that has a substrate that includes areas of weakness that are away from areas occupied by semiconductor devices.

Yamazaki is silent with regard to the creation of weakened areas *away from* the semiconductor devices. Yamazaki teaches the temporary use of a rigid flat substrate 101 to support a flexible film 103 while the integrated circuit is being built upon the film 103. Between the substrate 101 and the film 103 is a peel-away layer 102 that facilitates the removal of the integrated circuit on the film 103 from the rigid substrate 101. Figure 2C

of Yamazaki illustrates a cross-section of the integrated circuit as it is built upon the rigid substrate 101, and Figure 3A illustrates the separation of the integrated circuit on film 103 from the rigid substrate 101. Note the absence of the layer 102 in Figure 3A. As taught by Yamazaki, after peeling the integrated circuit from the substrate 101, the peeling layer 102 is removed from the film 103 (Yamazaki, column 2, lines 59-60, and column 3, lines 1-2).

To facilitate the peeling of the integrated circuit from the substrate 101, via the peeling layer 102, substrate 101 contains: "Fine concave portions... several thousand Angstroms to several micrometers in width and height, several to several tens of micrometers in depth... It is preferable to make the concave portions deep in a range in which the flatness of a peeling layer 102 formed later is maintained" (Yamazaki's column 6, lines 50-57). The density of the OCD solution that is used to form the peeling layer 102 is adjusted to assure that when the solution is placed on the substrate 101, the solution is unable to flow into the concave grooves of the substrate 101, thereby leaving gaps 701 between the substrate 101 and the peeling layer 102, as illustrated in Yamazaki's Figure 7. Because of these gaps 701, the adhesion of the peeling layer 102 to the substrate 101 is substantially diminished, thereby facilitating the peeling-away of the peeling layer 102 from the substrate 101.

The Office action includes an assertion that Yamazaki's Figures 3 and 7 corresponds to the applicant's invention, and that the substrate of Yamazaki contains areas of weakness at selected regions away from the semiconductor devices, at which areas of weakness flexing of the substrate occurs readily. The applicant respectfully traverses this characterization of Yamazaki. As specifically taught by Yamazaki, the substrate 101 is a rigid glass material. The grooves in the substrate 101 are not provided to allow flexing of this glass substrate, and are not located away from the semiconductor devices. As illustrated in Yamazaki's Figure 7, the grooves are preferably uniformly distributed across the substrate 101, to facilitate the peeling-away of the integrated circuit, via the peeling layer 102. One of ordinary skill in the art will recognize that the areas of stress during the peeling-away process are localized to regions between the grooves. There is no suggestion in Yamazaki that the grooves should be located in any particular relation to the semiconductor devices. Further, to reduce the stress at the

locations of the semiconductor devices, one of ordinary skill in the art would place the grooves at the locations of the semiconductor devices of Yamazaki, rather than away from the devices as claimed by the applicant, because in Yamazaki, the grooves provide the least peeling-away stress.

Because Yamazaki does not teach the creation of areas of weakness that facilitate flexing away from areas of semiconductor devices, as specifically claimed in claim 1, upon which each of the other claims depend, the applicant respectfully requests withdrawal of the rejection of claims 1-3, 5, 10, and 12-14 under 35 U.S.C. 102(b).


The Office action rejects claims 4, 6, 8, 9, 11, and 15 under 35 U.S.C. 103(a) over Yamazaki. The applicant respectfully traverses this rejection, based on the comments above regarding the applicant's claim 1, upon which each of these claims depends.

Because Yamazaki neither teaches nor suggests the creation of areas of weakness that facilitate flexing away from areas of semiconductor devices, the applicant respectfully requests withdrawal of the rejection of claims 4, 6, 8, 9, 11, and 15 under 35 U.S.C. 103(a).

The Office action rejects claim 7 under 35 U.S.C. 103(a) over Yamazaki in view of Shanks et al. (USP 5,821,688, hereinafter Shanks). The applicant respectfully traverses this rejection, based on the comments above regarding the applicant's claim 1, upon which claim 7 depends. Shanks does not teach the creation of weak areas in a substrate to facilitate flexing away from areas of semiconductor devices. Accordingly, applicant respectfully requests withdrawal of the rejection of claim 7 under 35 U.S.C. 103(a).

In view of the foregoing, the applicant respectfully requests that the Examiner withdraw the rejections of record, allow all the pending claims, and find the present application to be in condition for allowance. If any points remain in issue that may best be resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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804-493-0707

CERTIFICATE OF MAILING OR TRANSMISSION

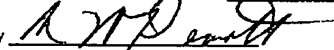
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On 5 November 2002

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

The paragraph that begins on page 12, line 28:

The second substrate 22 of the device, carrying the continuous common electrode 23, preferably has a thickness less than that of the substrate 20 so that it exhibits generally greater flexibility. For a colour display device using an array of colour filter elements associated with the array of pixel electrodes, the colour filter element array may be carried on the substrate 22 but preferably is provided on the substrate 20. A similar technique could be applied to the substrate 22 to form lines of weakness in the row and/or column directions which lines are arranged to overlie regions between adjacent rows and/or columns of pixel electrodes 18 on the substrate 20, as illustrated in Figure 8.

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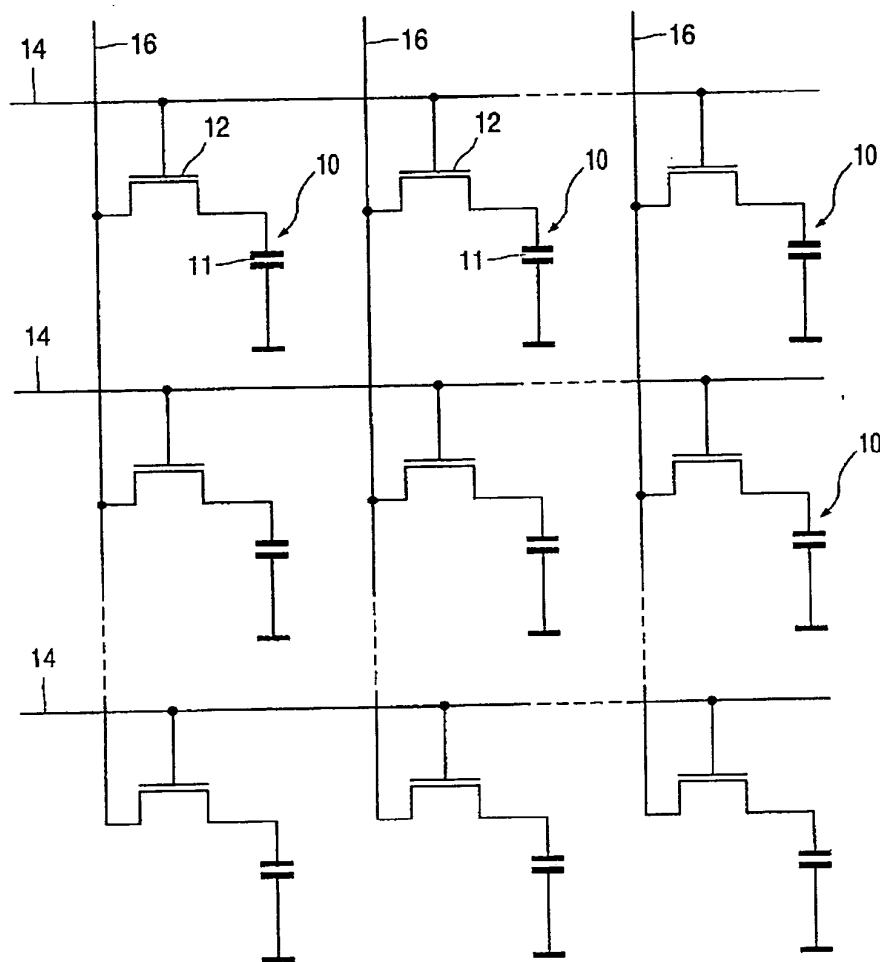


FIG. 1 [PRIOR ART]

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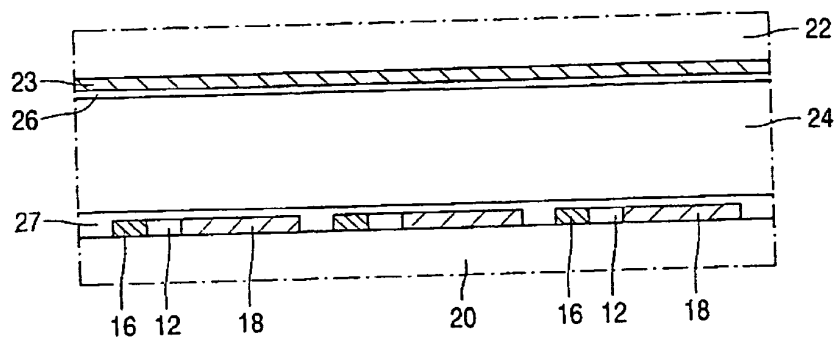


FIG. 2 [PRIOR ART]

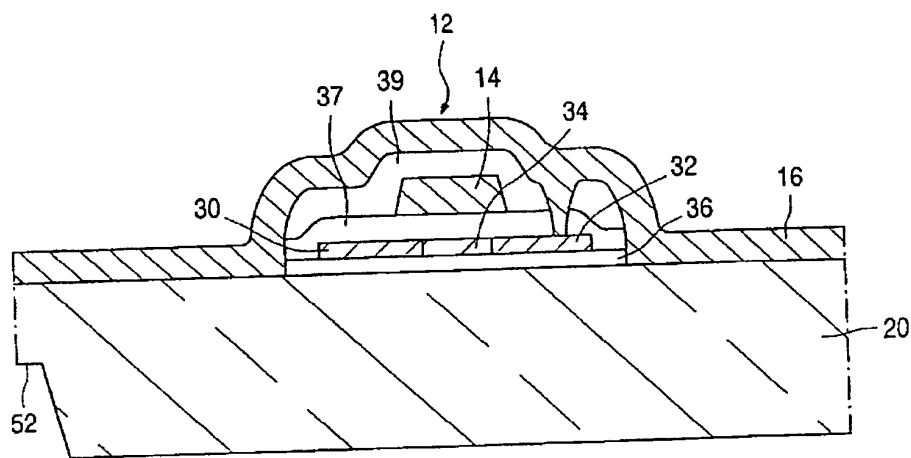


FIG. 5

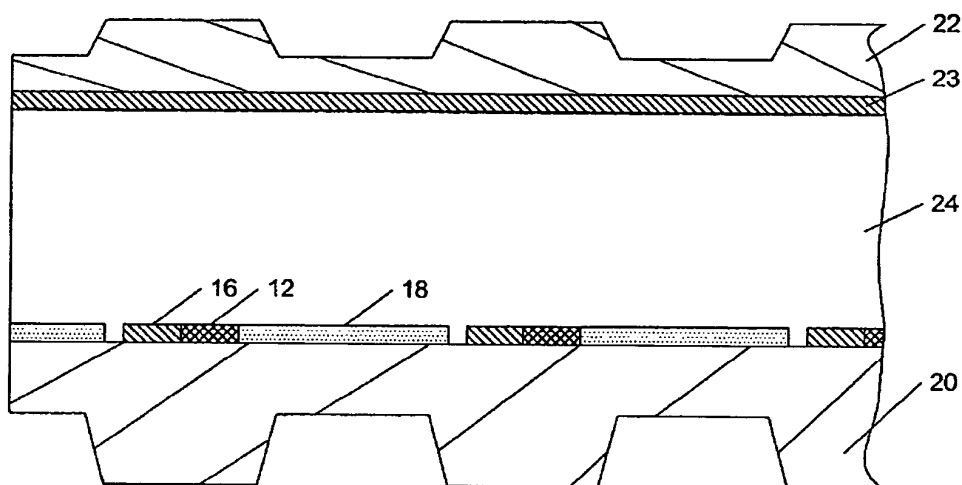


FIG. 8